Traffic Calming

Traffic Engineering
City of Lynchburg
November 18, 2004

Source: Reid Ewing, ITE, September, 1999.

Why Are We Here?

- Complaints to Council and Staff About:
  - Speeding
  - Cut-Thru Traffic
  - Unsafe Conditions
  - Exacerbated by New Development in Certain Areas

Some Speeding Concerns in Lynchburg

Road Name	Speed Limit	85th Speed
Orchard St	25 mph	38 mph
Hurdle Hill	25 mph	38 mph
Wards Ferry	35 mph	46 mph
Roundelay Rd	25 mph	36 mph

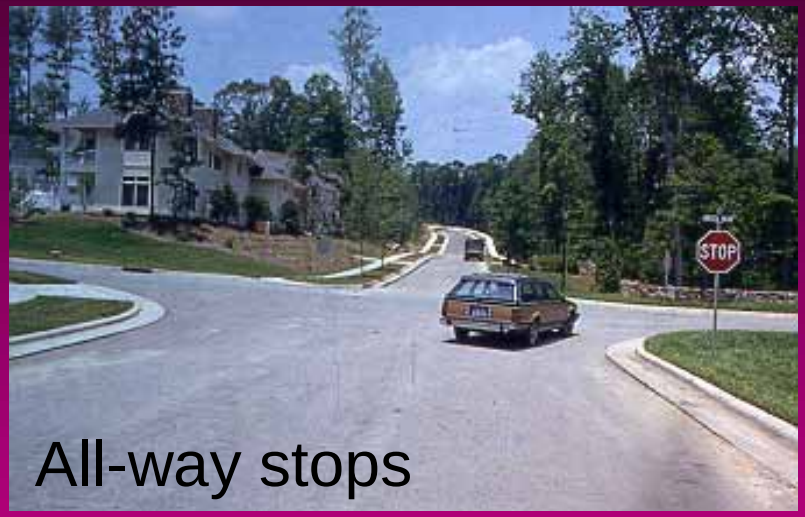
What Can the City Do?

- Increase Enforcement
- Neighborhood Safety Awareness Programs
- Implement Traffic Calming/Management Policy
- “Do-Nothing”

Definition of Traffic Calming

- Traffic calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes in the interest of street safety, livability, and other public purposes.

Measures Not Covered in Definition of Traffic Calming



All-way stops

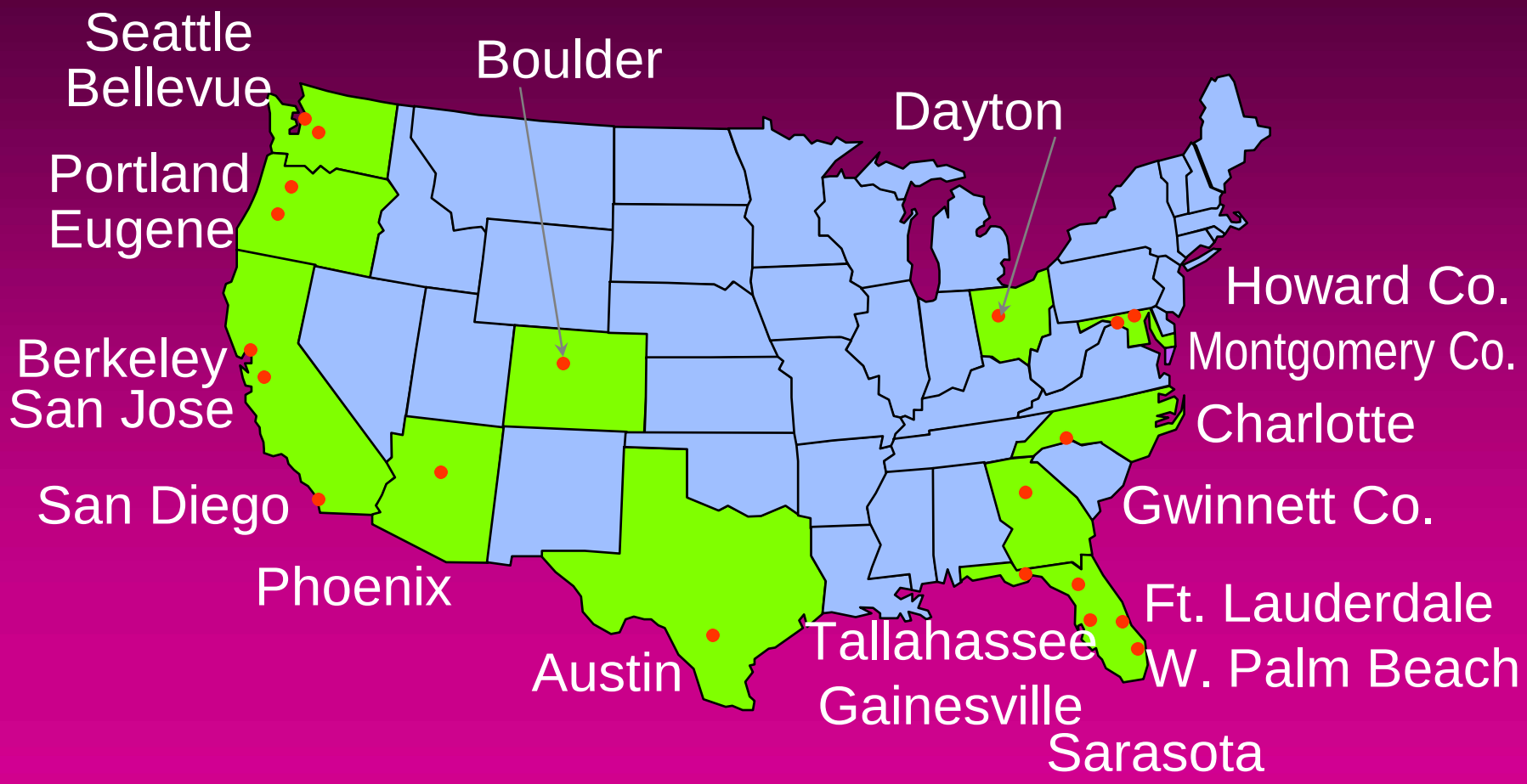
Speed limits/enforcement

Markings to narrow lanes

Roadside environment

Current Practice

Some Communities Who Have Traffic Calming



Traffic Calming in Virginia

- City of Harrisonburg
- City of Blacksburg
- City of Virginia Beach
- City of Charlottesville
- City of Alexandria
- City of Fairfax
- Virginia Department of Transportation

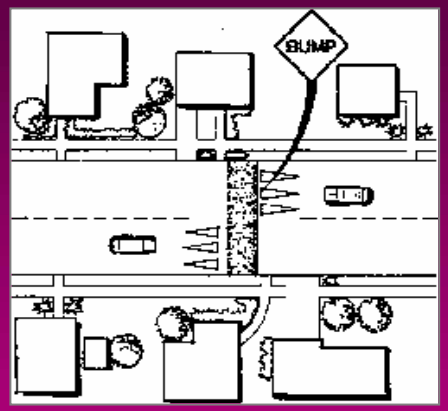
Bedford County Speed Hump

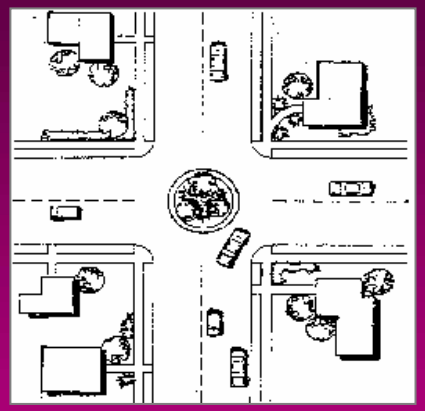
Cameron Road,
Bedford County

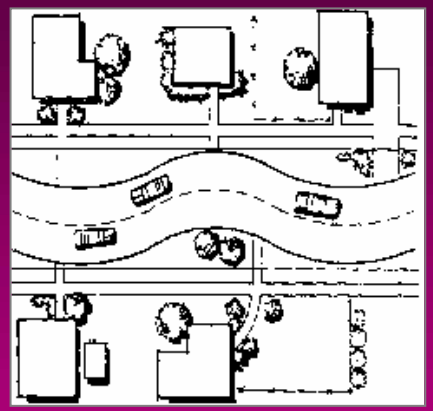
Some Controversy

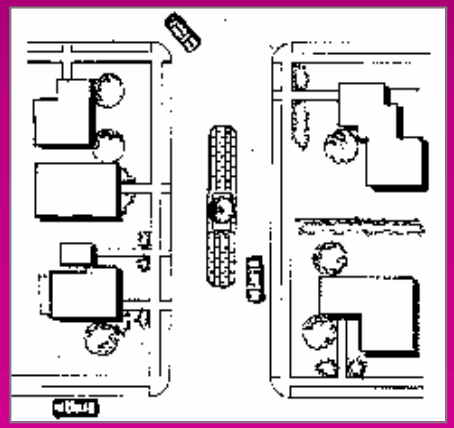
- Austin, TX
- Boulder, CO
- Ft. Lauderdale, FL
- Howard County, MD
- Gwinnett County, GA
- Montgomery County, MD
- Portland, OR
- San Diego, CA
- San Jose, CA
- Sarasota, FL

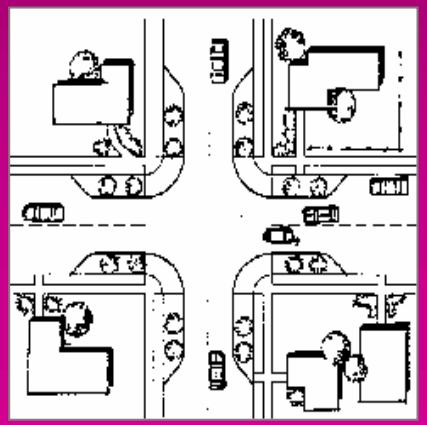
Types of Traffic Calming Measures

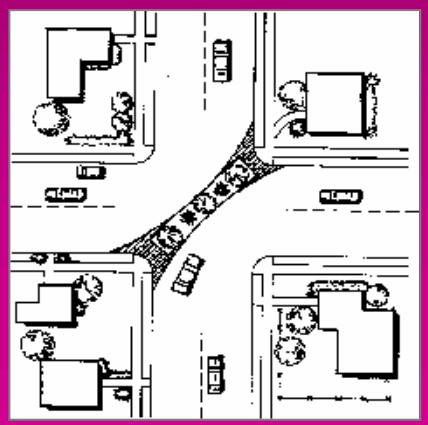




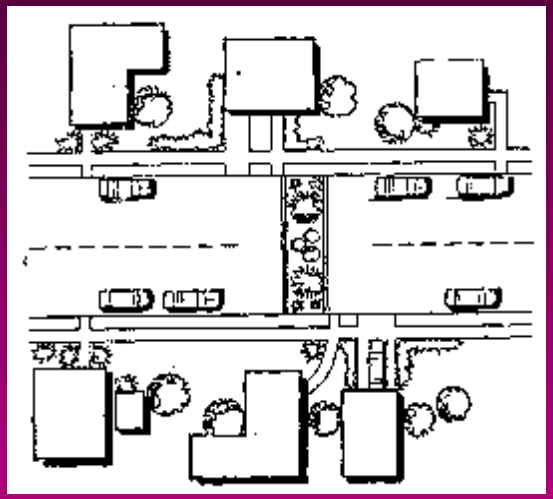








Full Closures
(cul-de-sacs, dead ends)

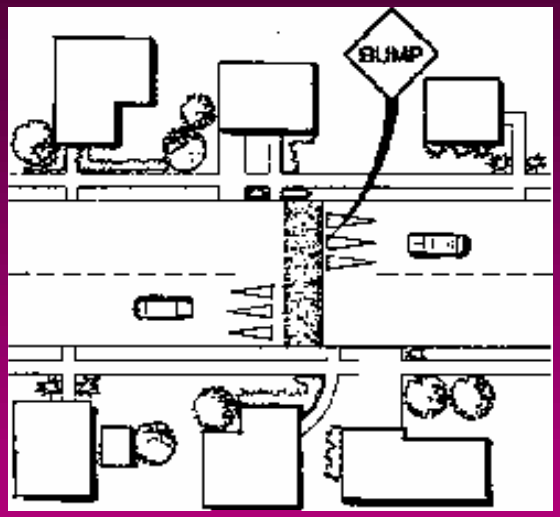


Berkeley, CA

Gainesville, FL

The line drawings provided on following slides were adapted from the City of Boulder's
Neighborhood Traffic Calming Mitigation Program Toolkit

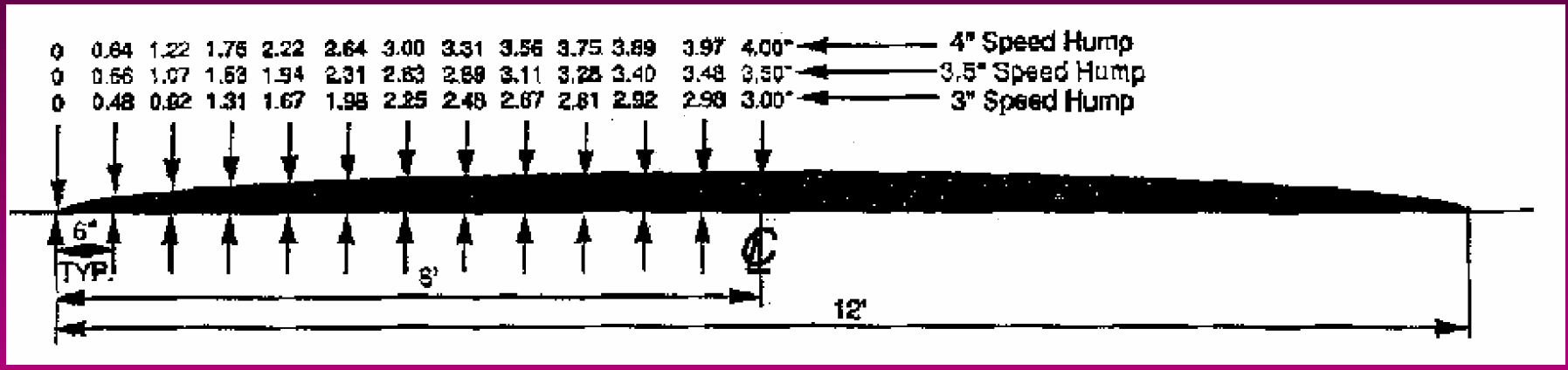
Speed Humps
(undulations)



14' Portland, OR

12' West Palm Beach, FL

12' Speed Hump Profile



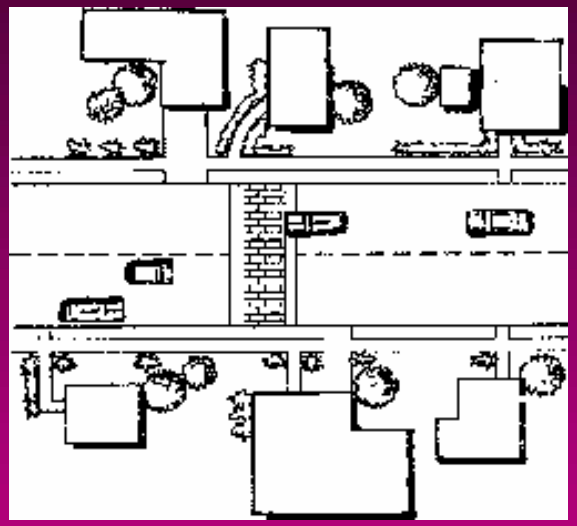
Source: Clement, J.P "Speed Humps and The Thousand Oaks Experience." City of Thousand Oaks. Thousand Oaks, CA, September 1982

ITE Speed Hump Guidelines

- Streets classified as "local"
- No more than 2 travel lanes or 40 foot pavement width
- Horizontal curve of 300 foot radius or more
- Vertical curve with adequate stopping sight distance
- Grade of 8 percent or less
- Posted speed limit of 30 mph or less
- No more than 5 percent long wheel-base vehicles
- Not on primary emergency response route or bus route
- Majority of residents support

Prefabricated Speed Hump
(Portland, OR)

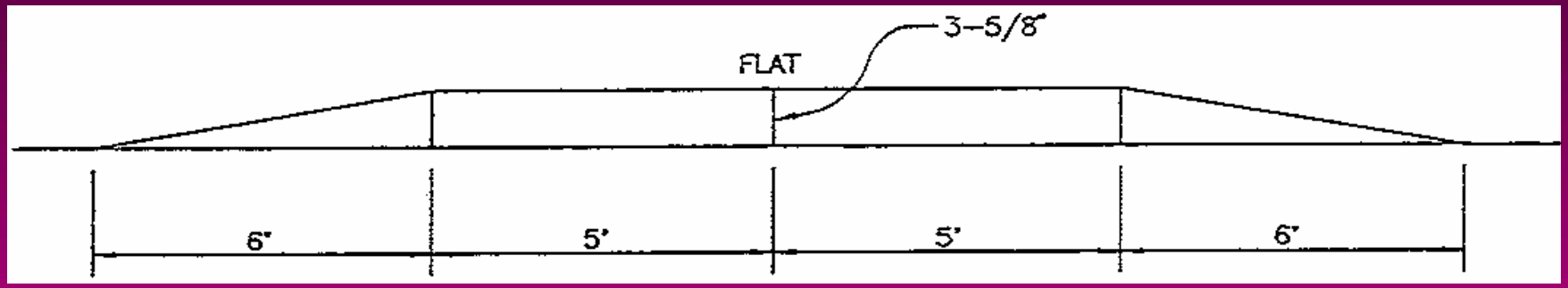
Speed Tables
(trapezoidal humps, flat topped humps)



Bellevue, WA

Charlotte, NC

22' Speed Table Profile
Gwinnett County, GA

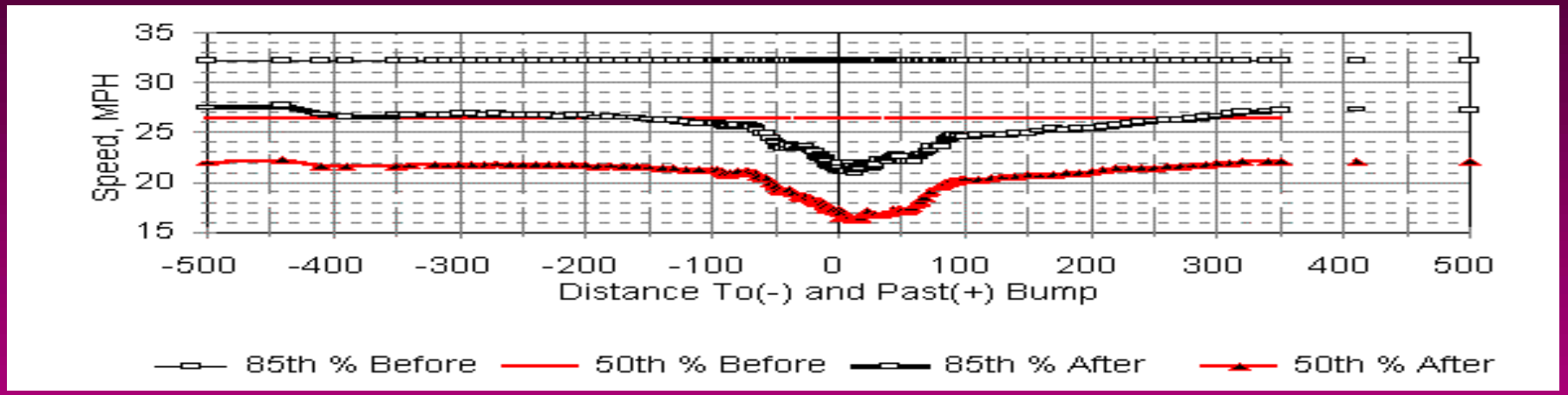


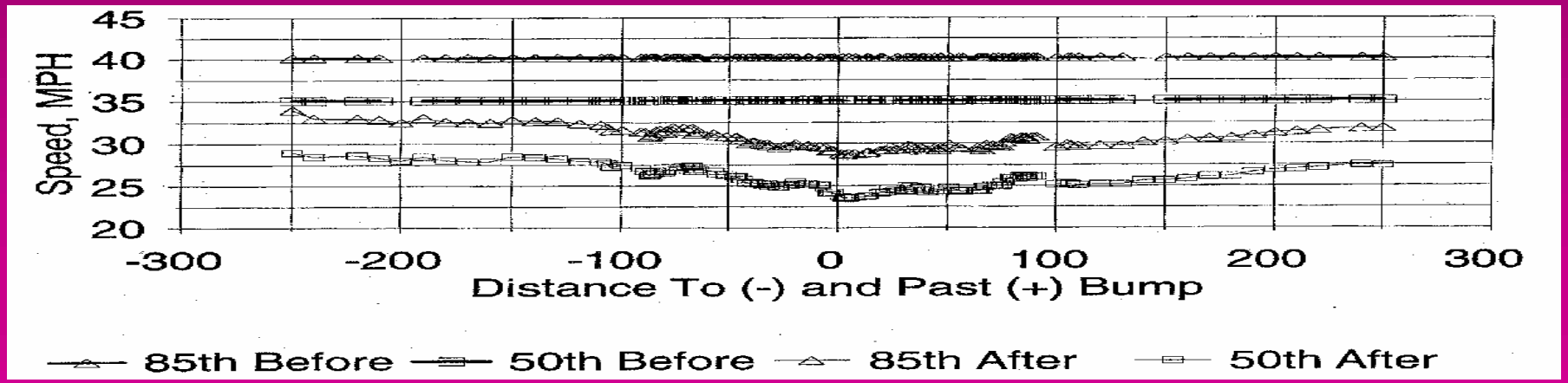
Source: County Traffic Engineer, “Standard Plan - 22’ Speed Hump, “Gwinnett County, GA, undated

Gentler Ride for All Vehicles

Serving As Raised Crosswalks

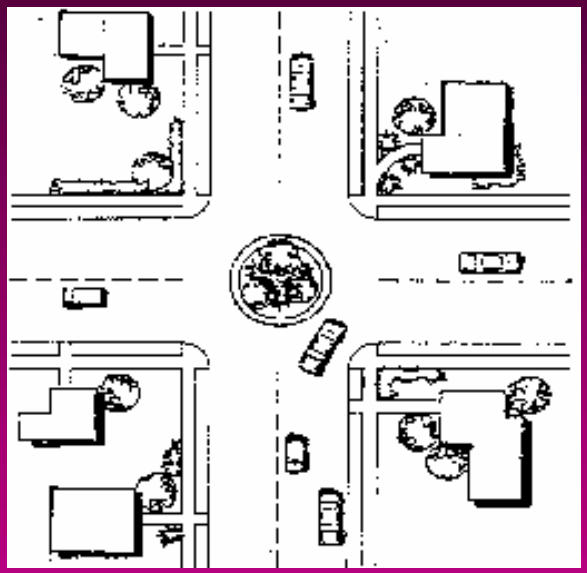
Speed Profiles Hump vs. Table





Source: City of Portland, Oregon

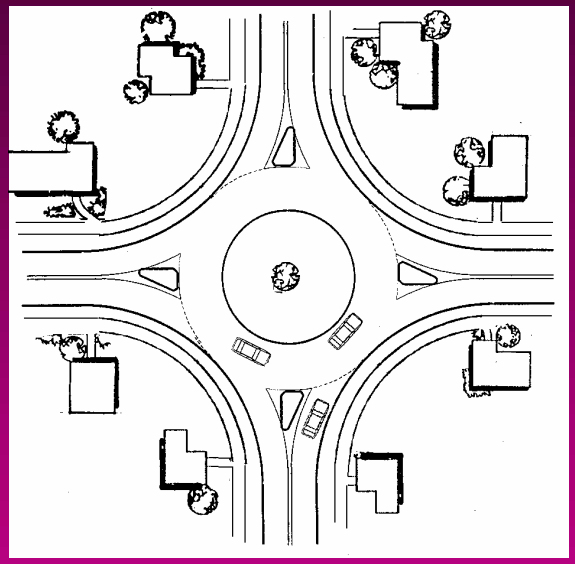
Traffic Circles
(rotaries, intersection islands)



Charlotte, NC

Portland, OR

Modern Roundabouts



Beaverton, OR

Las Vegas, NV

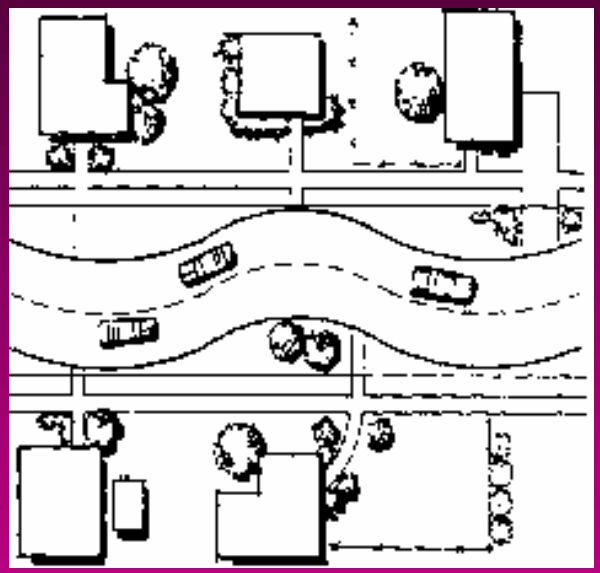
Roundabouts vs. Mini-Traffic Circles

Roundabout

Neighborhood Circle

Chicanes

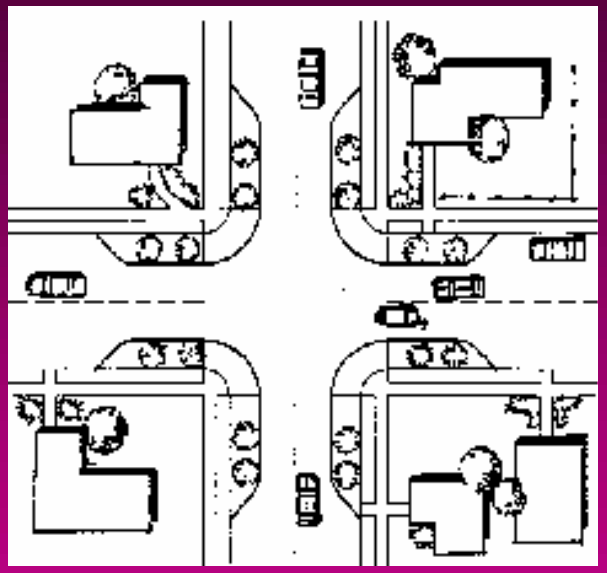
(deviations, serpentines, reversing curves)



Montgomery County, MD

Alachua, FL

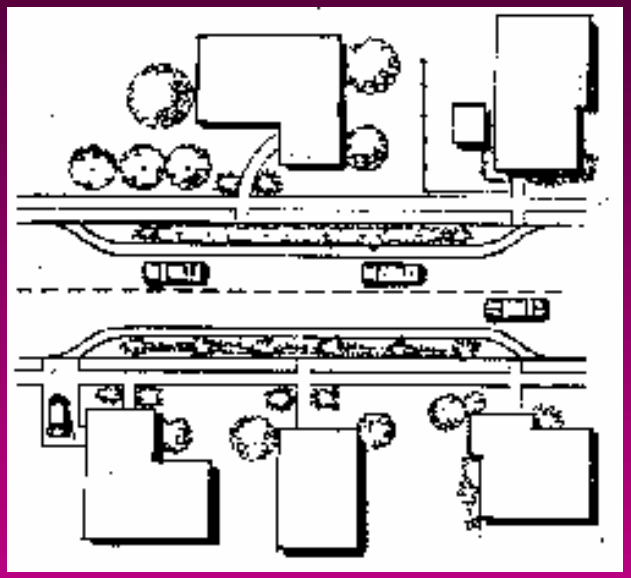
Neckdowns
(nubs, bulbouts, int. narrowings)



Eugene, OR

Sarasota, FL

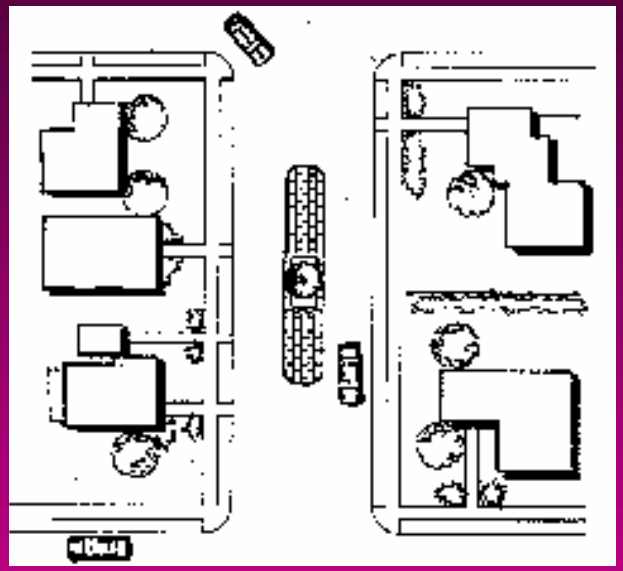
Chokers
(pinch points, midblock narrowings)



Ft. Lauderdale, FL

Cambridge, MA

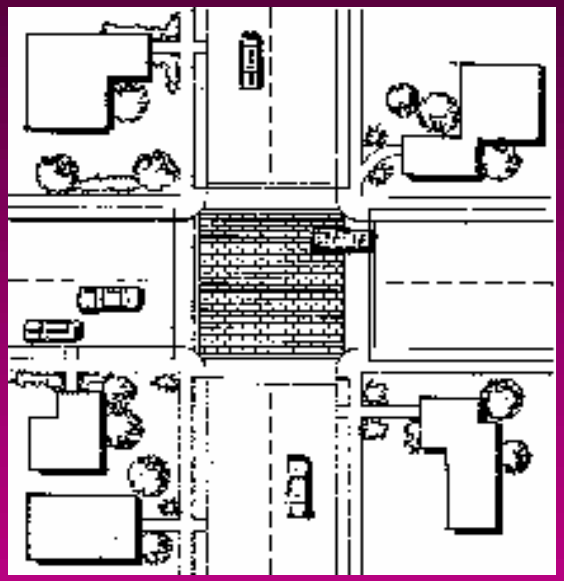
Center Island Narrowings
(midblock medians, pedestrian refuge, median slowpoints, median chokers)



Portland, OR

Tallahassee, FL

Raised Intersections
(raised junctions, intersection humps, plateaus)



Beaverton, OR

Columbia, MD

Combined Measures

Standard Cost Estimates

	Portland	Sarasota	Seattle
speed humps	$2-2,500	$2,000	$2,000
speed tables		$2,500	
raised intersections		$12,500	
traffic circles	$10-15,000	$3,500	$6,000
chicanes			$14,000
chokers	$7-10,000		
center islands	$8-15,000	$5,000	
median barriers	$10-20,000		
half closures	$40,000		$35,000
diagonal diverters			$85,000
full closures			$120,000

* Based on 1999 Figures

How Effective is Traffic Calming?

Speeds Between Slow Points

(85th Percentile)

	No. Sites	Speed After	Change in Speed	Percent Change
•12' Humps	179	27.4 mph	-7.6 mph	-22%
•14' Humps	15	25.6	-7.7	-23
•22' Tables	58	30.1	-6.6	-18
•Circles	45	30.3	-3.9	-11
•Narrowings	7	32.3	-2.6	- 4
•Half Closure	16	26.3	-6.0	-19
•Diverters	10	27.9	-1.4	- 4

Volume Impacts of Traffic Calming Measures

	No. Sites	Average Change in Volume	Percent Change
•12' Humps	143	-355	-18%
•14' Humps	15	-529	-22
•22' Tables	46	-415	-12
•Circles	49	-293	-5
•Narrowings	11	-263	-10
•Half Closures	53	-1611	-42
•Diverters	19	-501	-35

Safety Impacts of Traffic Calming Measures (U.S. Experience)

Measure	No. Sites	Avg. Annual Collisions Before	After	Change	Sig. Level
12'Humps	50	2.6	2.3	***-13%***	.40
14' Humps	5	4.4	2.6	***-40%***	.18
22' Tables	8	6.7	3.7	***-45%***	<.01
Circles w/o Seattle	17	5.9	4.2	***-28%***	.04
Overall	*163*	*2.5*	*1.2*	***-51%***	*<.01*

Other Impacts of Traffic Calming

- Crime
- Livability
- Property Values
- Noise

Legal Issues

Minimizing Legal Challenges

- DO's
  - Have a written policy that is consistent with Comprehensive Plans and Transp. Plans
  - Identification of traffic problems via engineering studies
  - Consideration of alt. traffic calming measures
  - Prioritization of projects for funding on objective basis
  - Installation of measures on trial basis subject to follow-up performance evaluation
  - Documentation of entire process

Minimizing Legal Challenges

- DO NOT's
  - Implement traffic calming based on popularity contests or neighborhood petitions
  - Implement traffic calming based on casual observations, ad-hoc conversations with residents, and intuitive judgements
  - Implement traffic calming without coordination from citizens and other city departments

Legal Experience of Other Agencies

- ITE District 6 Survey of over 90 traffic agencies showed that out of 1,500 traffic related lawsuits each year, only six were relating to traffic calming and only two had claims.
- Several challenges to cars bottoming-out on speed humps
- One claim in Portland filed that City did not do enough to calm traffic that led to fatality. Case dismissed.

Court Challenges

- Lack of adequate statutory authority to implement a given set of traffic calming measures on a given class of roadways
- Violations of the constitutional rights of affected landowners and travelers on the roadways
- Failure to take steps to minimize the risk to travelers from the installation of such measures

Emergency Response and Other Concerns

Generally Speaking(1)

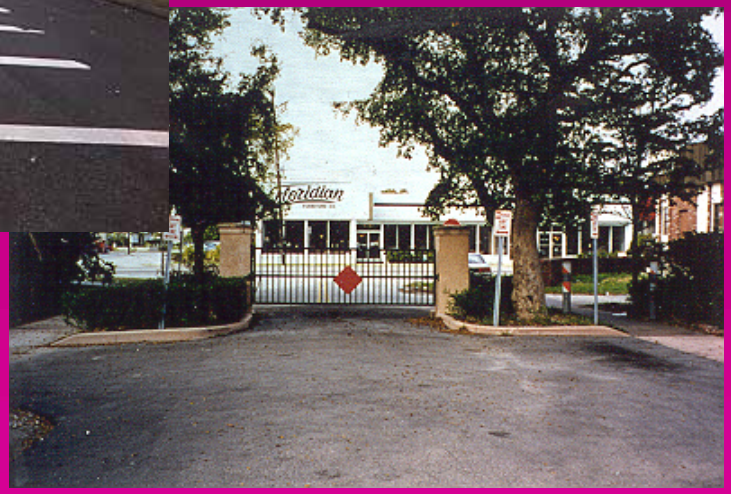
- Police are in favor of measures that slow traffic and help prevent crime
- Fire-Rescue are against anything that slows response time, however most responded that they could accept them if they are installed sparingly on residential streets (non-primary response routes)

(1) Based on a survey of 9 cities throughout US.

Strategies that have been used to Address Fire-Rescue's Concerns

- #1 Avoidance of Emergency Response Routes
- #2 Avoidance of Emergency Response Facilities
- #3 Gradual Escalation of Traffic Calming Measures
- #4 Communication
- #5 Use of Measures that Accommodate Fire-Rescue Vehicles
- #6 Redesign of Traffic Calming Measures

Traffic Calming Innovations



Approaches to Snow Clearance on Traffic Calmed Streets

- Familiarizing personnel with snowplow routes
- Marking traffic calming measures to let plow operators know exactly where they are
- Using appropriate equipment, such as rubber-tipped snowplow blades
- Applying salt and sand to residual snow
- Innovating in the geometric design of measures, such as the use in Canada of sinusoidal humps

VDOT Traffic Calming Criteria

- Defined/Adopted Statewide Process/Parameters
- Solid Engineering Criteria
- 75% Neighborhood Participation
- In Bedford VDOT Residency, of 5 requests, only one was carried through to implementation (2003 data)

Questions?

Potential Traffic Calming Signs???

Prevalence of Selected Measures
(ITE District 6 Survey)

Measure	Number of Jurisdictions
Speed Humps	79
Diverters/Closures	67
Traffic Circles	46
Engineering Measures	110
Total Responses	153